

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (currently amended). A composition comprising a human IL-3 (hIL-3) variant having increased affinity, relative to native hIL-3, for the high-affinity IL-3 receptor, wherein the variations from native hIL-3 comprise the replacement of one or both of the residues Asp¹⁰¹ and Lys¹¹⁶ by other amino acids.

~~a human interleukin 3 mutant polypeptide of the Formula:~~

Ala	Pro	Met	Thr	Gln	Thr	Thr	Ser	Leu	Lys	Thr	Ser	Trp	Val	Asn
1				5					10					15
Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa														
				20					25					30
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Xaa Xaa														
				35					40					45
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa														
				50					55					60
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa														
				65					70					75
Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa														
				80					85					90

~~Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa~~
_____95_____100_____105

~~Xaa Phe Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa~~
_____110_____115_____120

~~Xaa Xaa Xaa Gln Gln Thr Thr Leu Ser Leu Ala Ile Phe~~
_____125_____130

[SEQ ID NO:1]

wherein

~~Xaa at position 17 is Ser, Lys, Gly, Asp, Met, Gln, or~~
~~_____Arg;~~

~~Xaa at position 18 is Asn, His, Leu, Ile, Phe, Arg, or~~
~~_____Gln;~~

~~Xaa at position 19 is Met, Phe, Ile, Arg, Gly, Ala, or~~
~~_____Cys;~~

~~Xaa at position 20 is Ile, Cys, Gln, Glu, Arg, Pro, or~~
~~_____Ala;~~

~~Xaa at position 21 is Asp, Phe, Lys, Arg, Ala, Gly, Glu,~~
~~_____Gln, Asn, Thr, Ser or Val;~~

~~Xaa at position 22 is Glu, Trp, Pro, Ser, Ala, His, Asp,~~
~~_____Asn, Gln, Leu, Val or Gly;~~

~~Xaa at position 23 is Ile, Val, Ala, Leu, Gly, Trp, Lys,~~
~~_____Phe, Leu, Ser, or Arg;~~

~~Xaa at position 24 is Ile, Gly, Val, Arg, Ser, Phe, or~~
~~_____Leu;~~

~~Xaa at position 25 is Thr, His, Gly, Gln, Arg, Pro, or~~
~~_____Ala;~~

Xaa at position 26 is His, Thr, Phe, Gly, Arg, Ala, or
———Trp;
Xaa at position 27 is Leu, Gly, Arg, Thr, Ser, or Ala;
Xaa at position 28 is Lys, Arg, Leu, Gln, Gly, Pro, Val or
———Trp;
Xaa at position 29 is Gln, Asn, Leu, Pro, Arg, or Val;
Xaa at position 30 is Pro, His, Thr, Gly, Asp, Gln, Ser,
———Leu, or Lys;
Xaa at position 31 is Pro, Asp, Gly, Ala, Arg, Leu, or
———Gln;
Xaa at position 32 is Leu, Val, Arg, Gln, Asn, Gly, Ala,
———or Glu;
Xaa at position 33 is Pro, Leu, Gln, Ala, Thr, or Glu;
Xaa at position 34 is Leu, Val, Gly, Ser, Lys, Glu, Gln,
———Thr, Arg, Ala, Phe, Ile or Met;
Xaa at position 35 is Leu, Ala, Gly, Asn, Pro, Gln, or
———Val;
Xaa at position 36 is Asp, Leu, or Val;
Xaa at position 37 is Phe, Ser, Pro, Trp, or Ile;
Xaa at position 38 is Asn, or Ala;
Xaa at position 40 is Leu, Trp, or Arg;
Xaa at position 41 is Asn, Cys, Arg, Leu, His, Met, or
———Pro;
Xaa at position 42 is Gly, Asp, Ser, Cys, Asn, Lys, Thr,
———Leu, Val, Glu, Phe, Tyr, Ile, Met or Ala;
Xaa at position 43 is Glu, Asn, Tyr, Leu, Phe, Asp, Ala,
———Cys, Gln, Arg, Thr, Gly or Ser;
Xaa at position 44 is Asp, Ser, Leu, Arg, Lys, Thr, Met,
———Trp, Glu, Asn, Gln, Ala or Pro;
Xaa at position 45 is Gln, Pro, Phe, Val, Met, Leu, Thr,

~~———Lys, Trp, Asp, Asn, Arg, Ser, Ala, Ile, Glu or His;~~
Xaa at position 46 is ~~Asp, Phe, Ser, Thr, Cys, Glu, Asn,~~
~~———Gln, Lys, His, Ala, Tyr, Ile, Val or Gly;~~
Xaa at position 47 is ~~Ile, Gly, Val, Ser, Arg, Pro, or~~
~~———His;~~
Xaa at position 48 is ~~Leu, Ser, Cys, Arg, Ile, His, Phe,~~
~~———Glu, Lys, Thr, Ala, Met, Val or Asn;~~
Xaa at position 49 is ~~Met, Arg, Ala, Gly, Pro, Asn, His,~~
~~———or Asp;~~
Xaa at position 50 is ~~Glu, Leu, Thr, Asp, Tyr, Lys, Asn,~~
~~———Ser, Ala, Ile, Val, His, Phe, Met or Gln;~~
Xaa at position 51 is ~~Asn, Arg, Met, Pro, Ser, Thr, or~~
~~———His;~~
Xaa at position 52 is ~~Asn, His, Arg, Leu, Gly, Ser, or~~
~~———Thr;~~
Xaa at position 53 is ~~Leu, Thr, Ala, Gly, Glu, Pro, Lys,~~
~~———Ser, or Met;~~
Xaa at position 54 is ~~Arg, Asp, Ile, Ser, Val, Thr, Gln,~~
~~———Asn, Lys, His, Ala or Leu;~~
Xaa at position 55 is ~~Arg, Thr, Val, Ser, Leu, or Gly;~~
Xaa at position 56 is ~~Pro, Gly, Cys, Ser, Gln, Glu, Arg,~~
~~———His, Thr, Ala, Tyr, Phe, Leu, Val or Lys;~~
Xaa at position 57 is ~~Asn or Gly;~~
Xaa at position 58 is ~~Leu, Ser, Asp, Arg, Gln, Val, or~~
~~———Cys;~~
Xaa at position 59 is ~~Glu Tyr, His, Leu, Pro, or Arg;~~
Xaa at position 60 is ~~Ala, Ser, Pro, Tyr, Asn, or Thr;~~
Xaa at position 61 is ~~Phe, Asn, Glu, Pro, Lys, Arg, or~~
~~———Ser;~~
Xaa at position 62 is ~~Asn His, Val, Arg, Pro, Thr, Asp, or~~

—— Ile;
Xaa at position 63 is ~~Arg, Tyr, Trp, Lys, Ser, His, Pro,~~
—— or Val;
Xaa at position 64 is ~~Ala, Asn, Pro, Ser, or Lys;~~
Xaa at position 65 is ~~Val, Thr, Pro, His, Leu, Phe, or~~
—— Ser;
Xaa at position 66 is ~~Lys, Ile, Arg, Val, Asn, Glu, or~~
—— Ser;
Xaa at position 67 is ~~Ser, Ala, Phe, Val, Gly, Asn, Ile,~~
—— Pro, or His;
Xaa at position 68 is ~~Leu, Val, Trp, Ser, Ile, Phe, Thr,~~
—— or His;
Xaa at position 69 is ~~Gln, Ala, Pro, Thr, Glu, Arg, Trp,~~
—— Gly, or Leu;
Xaa at position 70 is ~~Asn, Leu, Val, Trp, Pro, or Ala;~~
Xaa at position 71 is ~~Ala, Met, Leu, Pro, Arg, Glu, Thr,~~
—— Gln, Trp, or Asn;
Xaa at position 72 is ~~Ser, Glu, Met, Ala, His, Asn, Arg,~~
—— or Asp;
Xaa at position 73 is ~~Ala, Glu, Asp, Leu, Ser, Gly, Thr,~~
—— or Arg;
Xaa at position 74 is ~~Ile, Met, Thr, Pro, Arg, Gly, Ala;~~
Xaa at position 75 is ~~Glu, Lys, Gly, Asp, Pro, Trp, Arg,~~
—— Ser, Gln, or Leu;
Xaa at position 76 is ~~Ser, Val, Ala, Asn, Trp, Glu, Pro,~~
—— Gly, or Asp;
Xaa at position 77 is ~~Ile, Ser, Arg, Thr, or Leu;~~
Xaa at position 78 is ~~Leu, Ala, Ser, Glu, Phe, Gly, or~~
—— Arg;
Xaa at position 79 is ~~Lys, Thr, Asn, Met, Arg, Ile, Gly,~~

——— or Asp;
Xaa at position 80 is Asn, Trp, Val, Gly, Thr, Leu, Glu,
——— or Arg;
Xaa at position 81 is Leu, Gln, Gly, Ala, Trp, Arg, Val,
——— or Lys;
Xaa at position 82 is Leu, Gln, Lys, Trp, Arg, Asp, Glu,
——— Asn, His, Thr, Ser, Ala, Tyr, Phe, Ile, Met or Val;
Xaa at position 83 is Pro, Ala, Thr, Trp, Arg, or Met;
Xaa at position 84 is Cys, Glu, Gly, Arg, Met, or Val;
Xaa at position 85 is Leu, Asn, Val, or Gln;
Xaa at position 86 is Pro, Cys, Arg, Ala, or Lys;
Xaa at position 87 is Leu, Ser, Trp, or Gly;
Xaa at position 88 is Ala, Lys, Arg, Val, or Trp;
Xaa at position 89 is Thr, Asp, Cys, Leu, Val, Glu, His,
——— Asn, or Ser;
Xaa at position 90 is Ala, Pro, Ser, Thr, Gly, Asp, Ile,
——— or Met;
Xaa at position 91 is Ala, Pro, Ser, Thr, Phe, Leu, Asp,
——— or His;
Xaa at position 92 is Pro, Phe, Arg, Ser, Lys, His, Ala,
——— Gly, Ile or Leu;
Xaa at position 93 is Thr, Asp, Ser, Asn, Pro, Ala, Leu,
——— or Arg;
Xaa at position 94 is Arg, Ile, Ser, Glu, Leu, Val, Gln,
——— Lys, His, Ala, or Pro;
Xaa at position 95 is His, Gln, Pro, Arg, Val, Leu, Gly,
——— Thr, Asn, Lys, Ser, Ala, Trp, Phe, Ile, or Tyr;
Xaa at position 96 is Pro, Lys, Tyr, Gly, Ile, or Thr;
Xaa at position 97 is Ile, Val, Lys, Ala, or Asn;
Xaa at position 98 is His, Ile, Asn, Leu, Asp, Ala, Thr,

~~— Glu, Gln, Ser, Phe, Met, Val, Lys, Arg, Tyr or Pro;~~

~~Xaa at position 99 is Ile, Leu, Arg, Asp, Val, Pro, Gln,~~

~~— Gly, Ser, Phe, or His;~~

~~Xaa at position 100 is Lys, Tyr, Leu, His, Arg, Ile, Ser,~~

~~— Gln, or Pro;~~

~~Xaa at position 101 is Asp, Pro, Met, Lys, His, Thr, Val,~~

~~— Tyr, Glu, Asn, Ser, Ala, Gly, Ile, Leu, or Gln;~~

~~Xaa at position 102 is Gly, Leu, Glu, Lys, Ser, Tyr, or~~

~~— Pro;~~

~~Xaa at position 103 is Asp, or Ser;~~

~~Xaa at position 104 is Trp, Val, Cys, Tyr, Thr, Met, Pro,~~

~~— Leu, Gln, Lys, Ala, Phe, or Gly;~~

~~Xaa at position 105 is Asn, Pro, Ala, Phe, Ser, Trp, Gln,~~

~~— Tyr, Leu, Lys, Ile, Asp, or His;~~

~~Xaa at position 106 is Glu, Ser, Ala, Lys, Thr, Ile, Gly,~~

~~— or Pro;~~

~~Xaa at position 108 is Arg, Lys, Asp, Leu, Thr, Ile, Gln,~~

~~— His, Ser, Ala or Pro;~~

~~Xaa at position 109 is Arg, Thr, Pro, Glu, Tyr, Leu, Ser,~~

~~— or Gly;~~

~~Xaa at position 110 is Lys, Ala, Asn, Thr, Leu, Arg, Gln,~~

~~— His, Glu, Ser, Ala, or Trp;~~

~~Xaa at position 111 is Leu, Ile, Arg, Asp, or Met;~~

~~Xaa at position 112 is Thr, Val, Gln, Tyr, Glu, His, Ser,~~

~~— or Phe;~~

~~Xaa at position 113 is Phe, Ser, Cys, His, Gly, Trp, Tyr,~~

~~— Asp, Lys, Leu, Ile, Val or Asn;~~

~~Xaa at position 114 is Tyr, Cys, His, Ser, Trp, Arg, or~~

~~— Leu;~~

~~Xaa at position 115 is Leu, Asn, Val, Pro, Arg, Ala, His,~~

~~—— Thr, Trp, or Met;~~
~~Xaa at position 116 is Lys, Leu, Pro, Thr, Met, Asp, Val,~~
~~—— Glu, Arg, Trp, Ser, Asn, His, Ala, Tyr, Phe, Gln, or~~
~~—— Ile;~~
~~Xaa at position 117 is Thr, Ser, Asn, Ile, Trp, Lys, or~~
~~—— Pro;~~
~~Xaa at position 118 is Leu, Ser, Pro, Ala, Glu, Cys, Asp, or Tyr;~~
~~Xaa at position 119 is Glu, Ser, Lys, Pro, Leu, Thr, Tyr,~~
~~—— or Arg;~~
~~Xaa at position 120 is Asn, Ala, Pro, Leu, His, Val, or~~
~~—— Gln;~~
~~Xaa at position 121 is Ala, Ser, Ile, Asn, Pro, Lys, Asp,~~
~~—— or Gly;~~
~~Xaa at position 122 is Gln, Ser, Met, Trp, Arg, Phe, Pro,~~
~~—— His, Ile, Tyr, or Cys;~~
~~Xaa at position 123 is Ala, Met, Glu, His, Ser, Pro, Tyr,~~
~~—— or Leu;~~

~~and which can additionally have Met preceding the amino acid in position 1; and wherein from 1 to 14 amino acids can be deleted from the N terminus and/or from 1 to 15 amino acids can be deleted from the C terminus; and wherein from 4 to 44 of the amino acids designated by Xaa are different from the corresponding amino acids of native (1-133) human interleukin-3;~~

~~—— a colony stimulating factor; and~~
~~—— at least one non-toxic pharmaceutically acceptable carrier.~~

Claims 2-12 (withdrawn).

Claims 13-26 (cancelled).